WINGS AND THINGS THAT FLY

A Kindergarten through 3rd Grade Topic Hot List

These web sites focus on **Nature's Flyers**
and the question,

"What have scientists learned about flight from nature?"

Flight fascinates everyone, from the very young to adults. The sites found here will help you investigate wings and things that fly. You will journey through nature's flyers, how things fly, and famous flyers through time. Fasten your seatbelts for this adventure in learning!

IS IT A BIRD, OR IS IT A PLANE?
Lesson/Teacher resource

http://www.nasaexplores.com/lessons/01-083/k-4_2-t.html

FLY LIKE THE BIRDS!
Lessons learned from Mother Nature/article/lessons

http://www.nasaexplores.com/lessons/01-071/k-4_index.html

NASA Sci Files
The Case of the Challenging Flight
Segment 3--Shapes of Nature Activity: compare and contrast the shapes and designs of animals to airplanes

http://scifiles.larc.nasa.gov

K-8 AERONAUTICS INTERNET TEXTBOOK
Aerodynamics of pterosaurs, insects, birds, bats, marine animals

http://wings.avkids.com
click on Principles of Aeronautics click on animals

FLAPPING WINGS!
Introduction to Ornithopters

http://www.ornithopter.org/flapflight

RAYS: WINGS IN THE WATER
Search: Wings In The Water Click on #6

http://www.aqua.org

INSECT FLIGHT AIDS MICROPLANE DESIGN

http://www.howstuffworks.com/news-item223.html

National Wildlife Magazine
Conventional law of aerodynamics as it applies to animals and insects

http://www.nwf.org/nationalwildlife/flight.html

Curriculum Bridges: Wings
Source for books on content area
search wings to airplanes

http://www.avkids.com

Aerodynamics
Flight from birds and insects to planes

http://www.grc.nasa.gov/WWW/K-12?aerosim/Manuel/fsim0003.html

Aerospace Team On-Line
Chapter on Aerodynamics of animals
http://www.quest.arc.nasa.gov/aero/background/

Scientific American Frontiers
Show 603 Flying High, Cockpit Confusion, Bird Man, The Eternal Wing, Taking To The Air, Roboflyers
Show 402 Flight of the Dragonfly
http://www.pbs.org/saf/index.html

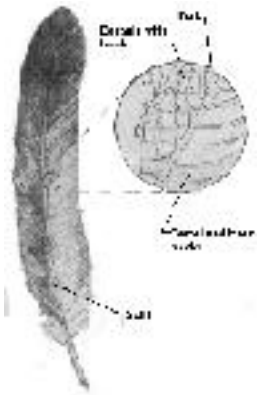
Maple Seed Flyer Activity

http://www.grc.nasa.gov/WWW/K-12/TRC/Aeronautics/Maple_Seed.html

Books:
The Way Things Work by David Macaulay
Houghton Mifflin Co., 1988

Eyewitness Books by Dorling Kindersley:
Flying Machine, 1990
Bird, 1988
Insect, 1990

Sixteen Flying Machines Inspired by Leonardo da Vinci



NOTES FOR TEACHERS AND PARENTS

A Topic Hotlist is an organized list of web resources centered on a theme or topic. This collection of Internet sites has information regarding the **Key Focus Questions**:

- **What have scientists learned about flight from nature?**
- **How did "Nature's Flyers" influence the development of man-made flight?**

This Topic Hotlist was compiled for teachers who will use the resources to design and develop a unit of study on flight, in conjunction with the Centennial of Flight observances this year, celebrating 100 years of powered flight. Teachers may wish to use this list in conjunction with the NASA Subject Sampler, "Wings and Things that Fly". Some of the sites provide information and other links and resources appropriate for use by teachers when planning lessons on flight, while other sites found on this list are interactive, and contain already developed lesson plans or activities.

Although several of the sites are fairly technical, at least one site, NASA's Why Flies <http://whyfiles.larc.nasa.gov> is designed especially for the K-3 student. The K-8 Aeronautics Internet Text Book is also a "kid friendly" site. <http://wings.avkids.com> The Aerospace Team On-Line Chapter on Aerodynamics of animals http://www.quest.arc.nasa.gov/aero/background/ is accessible to a high third grade reader, and does a good job of addressing the Key Focus Question, "What have scientists learned about flight from nature?" An excellent hands-on classroom activity can be found at "Maple Seed Flyer Activity" http://www.grc.nasa.gov/www/k-12/TRC/Aeronautics/Maple_Seed.html.

Teachers will need to create templates for younger children and select appropriate materials in order to adapt activities to the learning ability of the students. For older students, teachers may assign a focus question to pairs of students or to cooperative groups. Using a variety of technology applications students may then create multimedia (e.g. Hyperstudio, PowerPoint, Web page) presentations in various formats (oral, written, dramatizations) in answer to the focus questions, after browsing selected websites drawn from the Topic Hot List.

ADDRESSING THE STANDARDS

National Science Education Content Standards

Life Science Content Standard C
All students will develop an understanding of the characteristics of organisms.

Science and Technology Content Standard E
All students will develop abilities to distinguish between natural objects and objects made by humans.

Physical Science Content Standard B
All students will develop an understanding of properties of objects and materials and position and motion of objects

Earth and Space Science Content Standard D
All students will develop an understanding of objects in the sky.

History and Nature of Science Content Standard G
All students will develop an understanding of science as a human endeavor.

Technology Foundation Standards for Students

3. Technology productivity tools
Students use technology tools to enhance learning, increase productivity and promote creativity.
Students use productivity tools to collaborate in constructing technology-enhanced models, prepare publications and produce other creative works.

5. Technology research tools
Students use technology to locate, evaluate and collect information from a variety of sources.